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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/670,877	09/27/2000	KAZUO ICHIKAWA	107469	7376
25944	7590	12/03/2004	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			ZERVIGON, RUDY	
			ART UNIT	PAPER NUMBER
			1763	

DATE MAILED: 12/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/670,877

Applicant(s)

ICHIKAWA ET AL.

Examiner

Rudy Zervigon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) 3 and 4 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5 and 6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. This application contains claims 3 and 4 drawn to an invention nonelected with traverse on April 22, 2003. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1, 2, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hara et al (U. S. Pat. 5,648,276) in view of Babayan et al (US 2002/0129902 A1). Hara et al teaches a CVD system (C₁, C₂; Figure 2; column 7, lines 7-8) provided with a plasma generator (Fig.3, "UE", column 7, lines 15-20) having a plasma generation chamber (Fig. 3 containing "PL"; column 7, lines 15-20), including a circumferential wall (QW; Figure 3; column 7, lines 10-15) made of an insulator ("quartz"), the plasma generation chamber (Fig. 3 containing "PL"; column 7, lines 15-20) being separated from a film deposition chamber (Fig. 3 "QW" and "SW"; column 7, lines 10-15) in which a substrate (1) is arranged, and a film is deposited (column 7, lines 7-8) on the substrate within the same chamber (Fig. 3 "QW" and "SW"; column 7, lines 10-15) as the substrate is not moved (Fig.3). A material gas (Fig.3, "Gas (SiH₄, etc)") is directly supplied into the film deposition chamber, radicals in the plasma are introduced into the film deposition chamber from the plasma generator through introduction holes ("ME", mesh, Fig.3) of a lower plate (lower half of "ME"), and a thin film ("a-Si:H", column 7, lines 5-10) is deposited on the substrate. A gas feeder ("Gas (Ar, ...)"; Fig.3) is provided to the plasma generator.

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Hara et al further teaches a silicon-based film is deposited on a substrate (“a-Si:H”, column 7, lines 5-10, lines 65-67), then converting the silicon-based film to a crystalline silicon-based film by laser annealing (column 8, lines 5-11), then depositing a gate insulating film (“SiO₂”; column 8, lines 20-25) on the crystalline film by a CVD system comprised of a separate film deposition chamber and plasma generation chamber as described above. Plasma “cleaning” is discussed as a step prior to forming the gate insulating film (column 13, lines 9-20). Also, see column 14, lines 10-25 and column 17, lines 1-10.

Hara does not teach that the lower plate (lower half of “ME”) is connected to ground thereby allowing only radicals to pass. Further, Hara does not teach diameters of his introduction holes thereby allowing only radicals to pass.

Babayan teaches a capacitively coupled plasma apparatus (Figure 1). Specifically, Babayan teaches both electrically conductive upper (26, 28) and electrically conductive lower (22) electrodes as grounded ([0042]) thereby allowing only radicals to pass ([0039]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to ground Hara’s upper electrode (ME) as taught by Babayan, and to optimize the dimension of Hara’s introduction hole diameters thereby allowing only radicals to pass.

Motivation for Hara to ground is upper electrode as taught by Babayan and for Hara to optimize the dimension of Hara’s introduction hole diameters thereby allowing only radicals to pass is to avoid ion induced damage (last line, [0039]). Further, it is well established that changes in apparatus dimensions are within the level of ordinary skill in the art.(Gardner v. TEC Systems, Inc. , 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied , 469 U.S. 830, 225 USPQ

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232 (1984); In re Rose , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04).

Response to Arguments

4. Applicant's arguments filed on September 20, 2004 have been fully considered but they are not persuasive.

5. Applicant states:

“

In particular, neither Hara nor Babayan discloses or suggests radicals in a plasma are introduced into a film deposition chamber from the plasma generator through introduction holes of a lower plate. . . the lower plate is connected to ground as recited in independent claims 1 and 5. Moreover, neither Hara nor Babayan discloses or suggests each of the introduction holes is designed to pass the radicals only to the film deposition chamber, as recited in claim 1, and a diameter of each of the introduction holes is designed to pass the radicals only to the film deposition chamber, as recited in claim 5.

“

6. In response, the Examiner agrees with Applicant to the extent that only “Hara does not teach that his lower plate (lower half of “ME”) is not connected to ground thereby allowing only radicals to pass. Further, Hara does not teach diameters of his introduction holes thereby allowing only radicals to pass.” As stated in prior actions. However, the Examiner has cited Babayan who teaches a capacitively coupled plasma apparatus (Figure 1). Specifically, Babayan

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teaches both electrically conductive upper (26, 28) and electrically conductive lower (22) electrodes as grounded ([0042]) thereby allowing only radicals to pass –

“

In one embodiment, the invention confines the plasma to the powered and grounded electrodes, so that, for the most part, only neutral reactive species contact the substrate or work piece, thus avoiding ion bombardment and any significant ion-induced damage of the substrate or work piece.

”[0039]

Thus, as demonstrated by Babayan, Babayan’s apparatus provides teaching and stated motivation for Applicant’s claimed invention. Further, when the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent (In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); MPEP 2112.01). As is well known in the art, plasmas contain charged and uncharged, i.e. “neutral”, gas species. Babayan’s “neutral reactive species” must then also include Applicant’s claimed “radicals”.

7. Applicant states:

“

In paragraph (0042) of Babayan, members 26 and 28 are perforated sheets. Member 22 is a pedestal. These members 22, 26 and 28 are grounded, but are not expressed as “electrode”. Rather, in Fig. 1 and at paragraph (0042), Babayan discloses that the conductive upper electrode is the member 16, and the conductive lower electrode is the member 14.

“

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8. In response, Applicant's argument that Babayan's members 26 and 28 are only "perforated sheets" which are grounded, yet are not "electrodes" flies in the face of art-accepted definitions:

Cathode¹: *n* 2 the electron-emitting electrode of an electron tube

The Examiner asserts that Babayan's members 26 and 28 are negative conductive sheets, and are thus electrodes.

9. Applicant states, with regard to Babayan:

"

Therefore, the perforated sheets 26 and 28 plays no role in preventing passage of plasma, or the passing of only the radicals. That is, the electrically conductive upper electrodes (26, 28) and the electrically conductive lower electrode (22) as grounded perform different functions than that of the claimed lower plate.

" However, the Examiner has already demonstrated above in paragraph 6 above ([0039]) that Babayan's apparatus and teaching play central roles in preventing passage of plasma, and the passing of only the radicals.

10. In response to applicant's arguments (second paragraph page 3) against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

11. Applicant states:

"

¹ Merriam-Webster's Collegiate Dictionary, 10th Ed. , pp.181.

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Furthermore, Hara does not disclose or suggest that a cleaning gas feeder that is provided to a plasma generator. . wherein a cleaning gas is introduced through the cleaning gas feeder to produce plasma in the plasma generator and generate radicals, as recited in independent claim 1, and similarly recited in independent claim 5....(page 3)

Moreover, claims 1 and 5 recite the radicals are introduced. . .to the film deposition chamber to strike the substrate and thereby clean the substrate and further the film is deposited on the substrate within the same chamber, as the substrate is not moved. Nowhere does Hara disclose or suggest that the substrate is cleaned and a film is deposited on the substrate within the same chamber. (page 4)

“

12. In response to applicant's arguments, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). In fact, it has been demonstrated that Hara teaches a gas feeder (“Gas (Ar, ...)”; Fig.3), however, that the gas feed does not feed a “cleaning gas” is not a distinguishing structural claim requirement in apparatus claims as pending.

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272.1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after fax phone number for the 1763 art unit is (703) 872-9306. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (571) 272-1439.

Rudy Zervigon
12/1/4